THE AMERICAN REVIEW OF TUBERCULOSIS

OFFICIAL JOURNAL OF THE AMERICAN TRUDEAU SOCIETY

ABSTRACTS

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VOLUME LVII

JANUARY-JUNE, 1948

PUBLISHED MONTHLY

AT MOUNT ROYAL AND GUILFORD AVENUES, BALTIMORE 2, MD.
BY THE NATIONAL TUBERCULOSIS ASSOCIATION

THE

AMERICAN REVIEW OF TUBERCULOSIS ABSTRACTS

VOLUME LVII JANUARY, 1948 ABST. NO. 1

Treatment of Emphysema.—Experience shows that medication in pulmonary emphysema is purely sedative and transitory. Surgical measures, as suggested from time to time, have not fulfilled the hopes of their advocates. Recent physiopathological studies permit facing the problem from a different angle. The use of special belts increases intraäbdominal pressure and tends to replace the diaphragm in its normal position and further its motility. Pneumoperitoneum has been tried with apparent success in a limited number of cases. In 2 cases reported here this method brought about a marked increase in vital capacity and an elevation of the diaphragm. Pneumoperitoneum has its uses and may solve the palliative problem when applied in proper cases. In advanced obstructive cases little can be done.—*Cómo encarar el tratamiento del enfisematoso pulmonar, J. Armando Sciuto, Rev. de tuberc. d. Uruguay, December, 1946, 14: 237.*—(*A. A. Moll*)

Broncho-moniliasis.—The chest roentgenogram of a 36-year-old farm laborer with febrile erythema nodosum showed bilateral, spotty shadows and large lymphomata in the right hilum. The Mantoux test was negative. Four months later a pleurisy developed, and, again, a Mantoux test was negative. Histological changes found in the tonsils were considered characteristic for sarcoidosis. Serum albumin was 8.4 per cent with 4.37 per cent albumin and 4.03 per cent globulin. Guinea pig inoculation with sputum and gastric lavage fluid showed no tubercle bacilli. A profuse growth of *Monilia*, type *mortifera*, developed in Löwenstein's medium, and after two months' culture on Sabourraud agar there appeared numerous acid-fast elements. Guinea pig tests with the fungus and its acid-fast component were negative. In the tonsils from this patient both single fungus cells and small colonies of acid-fast rods were found, as well as some cones of the type described by Hallberg and thought by this author to be derived from fungus cells. In addition, two free lying formations were found in the tonsillar crypt, consisting of a vegetable stroma in which numerous acid-fast rods were lying. Intracutaneous injections of a solution prepared from a heat-killed Sabourraud agar culture produced only nonspecific changes in the patient. "It has not been possible to obtain any support for the theory of Törnell that the very common monilia saprophytes or their acid-fast transient forms should have any etiological significance" in sarcoidosis.—*Moniliasis in Lymphogranulomatosis benigna, L. E. Warfvinge, Acta med. Scandinav., 1947, 127: 286.*—(*O. Pinner*)

Intratracheal Penicillin in Bronchiectasis.—Thirteen adults with chronic suppurative bronchiectasis and one child with suppurative pneumonia and early bronchiectasis were treated with intratracheal instillations of penicillin. Seven to 15 instillations of 100,000 units of penicillin in 20 cc. saline solution were given over a period of eleven to eighteen days. Ten of the thirteen patients with chronic bronchiectasis had a drop of 50 per cent or more in the volume of sputum in twenty-four hours following the instillations. The reduction of sputum was beyond that obtained previously by injections of penicillin, nebulized penicillin or sulfonamides. Recurrence of

symptoms within two months was seen in 4 patients. Intratracheal penicillin therapy is advised for the preparation of patients for lobectomy. One child with suppurative pneumonia and atelectasis of more than three months' duration experienced immediate and lasting clearing and reëxpansion of two lobes after intratracheal instillation.—*Intratracheal Penicillin Therapy in Suppurative Bronchiectasis, L. E. Siltzbach, Arch. Int. Med., May, 1947, 79: 570.*—(*G. C. Leiner*)

Surgery for Bronchiectasis.—Fifty patients with bronchiectasis were treated by pulmonary resection. There was no postoperative death. Five patients developed empyema, 2 a bronchopulmonary fistula and one thrombophlebitis. Forty-two patients were able to resume normal activity.—*Appraisal of Surgrey in the Treatment of Bronchiectasis, R. Adams & B. J. Ficarra, J. A. M. A., May 17, 1947, 134: 240.*—(*H. Abeles*)

Intrabronchial Penicillin and Sulfonamides.—Twenty patients with suppurative pneumonitis and lung abscess, 16 with bronchiectasis and 2 with infected cystic disease, were treated with intrabronchial administration of penicillin and sulfanilamide. Each of these drugs was suspended in 40 per cent iodized oil and these suspensions were mixed to make a concentration of 3,000 units of penicillin and 0.1 g. of sulfanilamide per cc. In 14 cases of lung abscess with pneumonitis the suspension was administered to enter the diseased area; 10 were cured, 3 improved and one died. In this group there were 7 cases with a single lung abscess and 7 had extensive pneumonitis with several cavities. In cases of the latter type simple surgical drainage is not practicable, while the only alternative, lobectomy or pneumonectomy, may have a high mortality in toxemic and debilitated patients, so that successful medical treatment is of utmost importance. From 2 to 10 instillations, with an average of 4.4, were given in this group, and in several cases a dramatic result was noted after a few applications or the patients soon felt so well that they refused further treatment. In those cases where it was possible to do a follow-up bronchogram, residual minor bronchiectasis without symptoms except for an occasional cough was always found. In the remaining 6 cases of lung abscess and pneumonitis, the suspension failed to enter the diseased area; of these patients one was cured, one improved but subsequently died from unknown cause and 4 died. Some therapeutic effect of the penicillin absorbed from the bronchi near the affected area is possible but if adequate filling is not obtained after 2 or 3 instillations it is wiser to abandon the attempt and adopt other measures. In one of these cases penicillin was twice injected into a giant abscess through the chest wall, and when this proved to be ineffective, rib resection was performed; this patient died three days after operation. It is unlikely that so large an abscess can be cured by penicillin whatever the method of administration; it should be drained surgically without delay. Sixteen cases of bronchiectasis and 2 of infected cystic disease were treated with the same intrabronchial method using 3 instillations at intervals of from six to twelve weeks. This course was repeated when symptoms recurred. Fourteen patients had considerable relief, in 4 cases the benefit was slight to moderate. Some cases had as many as 25 instillations during eighteen months. In another group of 15 cases with bronchiectasis previously treated with sulfanilamide in lipiodol, 3 patients subsequently had to have a lobectomy, and 8 others were later on treated with the sulfanilamide-penicillin suspension; in these the combined treatment was symptomatically superior to the sulfanilamide alone. This treatment of bronchiectasis is indicated (*1*) in cases with minor degree of bronchial dilatation, not severe enough to warrant lobectomy, (*2*) where the extent of the disease or the general condition counterindicates lobectomy, or when the patient refuses operation, (*3*) to sterilize the bronchi and improve general health in preparation for lobectomy. As yet no signs have been observed that the infecting organisms have become penicillin-fast by repeated application.—*Intrabronchial Administration of Penicillin and Sulphonamide, B. A.*

Dormer & F. J. Wiles, Clin. Proc., J. Cape Town Post-Grad. M. A., March, 1947, 6: 10.—(O. Pinner)

Mediastinal Emphysema.—A 16-year-old Negro boy with spontaneous mediastinal emphysema was seen. Hamman's sign, fever and leucocytosis were present. The roentgenogram revealed air in the anterior and posterior mediastinum. The electrocardiogram showed signs of right axis deviation and of acute right ventricular strain. Ten days later the electrocardiogram had become normal.—*Spontaneous Mediastinal Emphysema with Acute Right Ventricular Strain, A. Klein, Am. Heart J., June, 1947, 33: 867.—(G. C. Leiner)*

Spontaneous Pneumothorax.—Retained gas in various portions of the body, such as intestinal gas or subcutaneous emphysema, is composed chiefly of nitrogen. In these conditions, when the patent inhales 100 per cent oxygen, blood coming into contact with this oxygen in the lungs gives off most of its nitrogen. In a short time, the retained nitrogen is all dissolved in the blood and then given off in the alveolar air which is almost entirely oxygen. The author reasoned that this principle might be used in the treatment of spontaneous pneumothorax. In one patient,the inhalation of 100 per cent oxygen for two or three hours several times daily over a period of twelve days apparently resulted in a more rapid reëxpansion of the lung. The inhalational therapy also produced immediate relief of chest pain. Further controlled use of this treatment is suggested.—*Oxygen Inhalation in the Treatment of Spontaneous Pneumothorax, E. Press, Ann. Int. Med., July, 1947, 27: 135.—(H. R. Nayer)*

Treatment of Empyema.—Gramicidin is a biological antiseptic. It was found to have a stronger effect upon staphylococci than tyrothrycin. Alcoholic solutions remain stable for many years. Thirteen cases of empyema were treated by instillation of a gramicidin solution after aspiration of pus. In the cases caused by gram-positive organisms, there was obvious improvement after two to three treatments. By the eighteenth day, no pus was evident. The treatment was ineffective in cases of tuberculous or putrid empyema.—*Treatment of Purulent Pleurisy with Gramicidin, M. I. Lavrentyeva, Am. Rev. Soviet Med., June, 1947, 4: 397.—(A. G. Cohen)*

Hydrothorax in Liver Cirrhosis.—Massive hydrothorax with no recognized etiological basis other than cirrhosis of the liver is rare. Six cases were found on autopsy among 600 cases of cirrhosis of the liver. Two cases are described in detail. The fluid was present in one case in the right pleural cavity only, in 2 cases in the left pleural cavity only and in 3 cases in both pleural cavities. The fluid had the characteristics of a transudate. The mechanism of the development of pleural fluid in these cases remains unexplained.—*Cirrhosis of the Liver with Massive Hydrothorax, D. G. McKay, H. J. Sparling & S. L. Robbins, Arch. Int. Med., May, 1947, 79: 501.—(G. C. Leiner)*

Collapse of Cava Superior.—X-ray studies with 40 per cent sodium iodide solution in dogs showed that the distension or collapse of the upper vena cava does not depend on a lowered pressure in the thorax. It is actually related to the position of the animal at the time. The vein collapses when the head is up, and distends in the vertical position when the head is down. During two pleuroscopies in man confirmation of these experiences was found, the vein collapsing or distending as the position of the head changed.—*Sobre el estado de distensión o colapso de la vena cava superior, J. Duomarco, R. Rimini & F. N. Fredari, Rev. de tuberc. d. Uruguay, September, 1946, 14: 151.—(A. A. Moll)*

Diagnosis of Amyloidosis.—The problem of diagnosis of amyloidosis has always been important in the management of certain chronic diseases, especially tuberculosis. In the latter, it is probably more common than is supposed as recent reports are similar to that from Sea View Hospital, in which amyloidosis was found in 22 per cent of 2,000 consecutive autopsies. Until Bennhold introduced the Congo red test

in 1923, the diagnosis was difficult and uncertain. However, difficulties have been apparent from the first, especially because of false positive tests. It is believed that the trouble lies in interpretation of the test, that is, that 90 to 99 per cent adsorption of the Congo red is only suggestive of amyloidosis, but that 100 per cent is very suggestive of amyloidosis. Also one test only cannot be relied upon. Therefore it is essential that the test be repeated at least once. The author has found that, when there is complete or nearly complete absorption of the dye on repeated tests, amyloidosis has always been found at autopsy. False negative tests will occur when there is only a small amount of amyloidosis present.—*The Diagnosis of Generalized Amyloidosis by the Congo Red Test: Definite Diagnostic Criteria, I. J. Selikoff, Am. J. M. Sc., June, 1947, 213: 719.*—(*G. F. Mitchell*)

Histoplasmin Sensitivity.—The conditions which produce histoplasmin sensitivity are still unknown although it seems reasonable to assume that the reactions and associated pulmonary lesions are specific evidence of some kind of infection. If the several members of a family were to show similarity in their skin reactions the implication would be that the agent producing sensitivity is present (or absent) among conditions affecting members of a family group. This condition could be genetic, broadly environmental, or specific environmental factors localized in the home. From a material of about 16,000 school children skin-tested with tuberculin and histoplasmin, 1,744 cases were analyzed, comprising 766 children who had older siblings who reacted to histoplasmin, and 978 with an older sibling who did not react; only white, life-time residents of the metropolitan area of Kansas City, Missouri, were considered in this study. A detailed, mainly statistical evaluation of all data involved shows: The percentage of reactors is higher among children whose older sibling is a reactor than in the group without reacting siblings, that is, there is a similarity in the histoplasmin reaction between children of the same family. This difference in the percentage of reactors between the two groups decreases with increasing age of the older child, and the degree of similarity is further influenced by the closeness in age of the siblings. When there is no more than two years' difference in age, the differences in reactors among siblings of a reactor and a nonreactor are greater. After elimination of those factors (geography, age, sex, race) known to affect the frequency of histoplasmin reactors, there remains some factor which makes siblings of a reactor more likely to react than siblings of a nonreactor. Other factors causing variations in histoplasmin sensitivity may well be disclosed by further detailed study. The fact that in Kansas City there was not a high concentration of reactors in some families and of nonreactors in other families suggests that there is implied a factor broader, and less localized, than one limited by familial environment.—*Histoplasmin Sensitivity among Siblings, Shirley H. Ferebee & M. L. Furcolow, Pub. Health Rep., June 6, 1947, 62: 834.*—(*O. Pinner*)

Epidemiology of Tuberculosis.—The contagious nature of tuberculosis was known many centuries B.C., as recorded in writings from India and Greece. In later centuries these early ideas were forgotten, and not until toward the end of the 17th century did the scientists of the Latin countries again recognize the contagious nature of the disease. Edward Mainwaring wrote in 1667: "You must not frequently converse with a phthisical person whose unwholesome breath may infect the sound by drawing in putrid vapours which the other breathes forth, but above all a phthisical bedfellow is most dangerous to affect a sound person and chiefly to be avoided." However, men such as Bright, Addison and Graves disregarded the contagious nature of tuberculosis and attached great importance to diathesis. Even Laennec did not believe that tuberculosis was contagious. In later years, in spite of the acceptance of the idea that the human tubercle bacillus was the infecting agent, it was difficult to prove and have accepted the idea of the contagious nature of the bovine bacillus for

man. It is now generally agreed that only two types, the human and the bovine, are causative agents of human infection, although the avian type may rarely be the cause. It has been shown that man can contract the disease from cattle and likewise can infect cattle. The infection of cattle may be by either the human or bovine bacillus. The chief pathway of infection for tuberculosis in man is the respiratory system. Other pathways may be through the gastrointestinal tract. Droplet infection is usually the source of the human tubercle bacillus. Tubercle bacilli may be inhaled without producing any recognizable lesion, and it must be assumed that in these cases the tubercle bacilli are destroyed. Both native and acquired resistance are the factors which prevent the disease from assuming epidemic proportions. From Lurie's work, it would appear that cellular resistance is more important than humoral. The source of human infection in childhood is usually a near relative. Repeated exposure and quantity of bacilli are the important factors in producing an infection, either one of which factors may overcome resistance. The primary infection may result either in a child or in an adult. It was observed that during the war more primaries appeared in adults, probably because of the migration of rural dwellers to industrial urban areas. In the child the lymph nodes usually show greater involvement than the lungs, and it is thought that this depends on the degree of hypersensitivity which the child has developed in the interval occurring between the lapsing of the lesion in the lungs and that in the nodes. In the older child, the tracheobronchial nodes contain less tuberculosis, and this is also true in the adult. This absence of secondary lesions in the nodes of older children and adults may partly be accounted for by the more frequent evidence of healing, as judged by the growth of fibrous tissue around the primary lesion. Age is undoubtedly an important factor in determining healing; the longer the primary infection in the child is delayed, the greater the chance of resolution. If the disease is not localized at or near the sight of infection, then in the child generalization occurs, resulting in acute generalized miliary tuberculosis, with or without tuberculous meningitis. The first infection in the lungs is on virgin soil. In most cases localization takes place. The patient has now developed hypersensitivity, which tends to lessen as age advances. The tissue reaction to reinfection tuberculosis depends on the degree of hypersensitivity, the immunity, dose and virulence of the infecting bacilli. In general, infected animals in which hypersensitivity has waned have acquired a high degree of resistance to any subsequent infection. The resistance is by no means absolute, and it may be broken down by acute or chronic disease, overwork and malnutrition. A high degree of hypersensitivity is an unfavorable factor, as demonstrated in animals. Alimentary infections occur by swallowing contaminated food, and in children by contaminated fingers from the floors on which droplets of sputum have been present. Imperfect cleansing of eating utensils may be the source, also. Tuberculosis of the cervical nodes is caused in the greater proportion of cases by the bovine type in countries in which tuberculosis in cattle is frequent. This holds also for primary intestinal infection. The more frequent occurrence of catarrhal conditions in the nasopharynx in childhood may act as a *locus minoris resistentiae*. The possibility of acquired resistance due to an arrested infection in the lungs may also determine the relative infrequency of alimentary tuberculosis in the adult. The rural inhabitant is more liable to bovine infection than the urban. In tuberculous meningitis, 8 per cent were infected with bovine strains in large burghs and cities of Scotland, as against 15.9 per cent in the rural areas of the counties. In those areas in which there are attested herds, the incidence of bovine tuberculosis is definitely less. It is also shown that in the cities where heat treatment of milk is used the incidence of bovine tuberculosis is less. It is felt that because of the large percentage of human infection in the urban areas, the acquired immunity thus reduces the chance of bovine

infection. Respiratory infection of bovine origin is rare but has occurred. The ideal, of course, is that all milk for human consumption should come from attested herds, but in Britain this is a long-term policy. In the meantime, heat treatment should be used. It is felt that BCG vaccination is still a controversial question.—*The Epidemiology of Tuberculosis, J. W. S. Blacklock, Brit. M. J., May 24, 1947, 4507: 707.*—(*R. W. Clarke*)

Tuberculosis and General Practitioner.—The private physician is the principal force in the control of tuberculosis and case-finding. Mass radiography is far superior to other approaches to tuberculosis control, such as examination of contacts of known cases which discovers as little as 25 per cent of new cases reported each year, or annual tuberculin-testing of the whole population which has been shown to be impracticable. By mass radiography teams the communities of the United States could be covered in less than five years, a short enough span of time to prevent the disease from spreading to a new generation. With this new method 65 to 70 per cent of all cases found have minimal lesions, while in recent years only 10 per cent of hospital admissions had minimal disease. Newly discovered cases and their families go to their family physicians for supervision, care and the necessary long-term follow-up. Intracutaneous tuberculin testing and X-ray examination on every not recently examined patient should be fundamental routine for the physician; the films should be interpreted in conferences with experts. Sputum examination of all patients with cough or expectoration will reveal 3 or 4 per cent positive specimens. In less populous areas the physician has to carry on case-finding and follow-up almost single-handed, and knowing his patient's personality he will know how to encourage him in the crisis often occurring upon the announcement of tuberculosis. His interest and his effectiveness as a worker in the community-wide program of tuberculosis control will grow as he learns of the latest advances in this field. Some of these developments are enumerated in detail in this paper: the great variation in tuberculin sensitivity depending on the dosage used and the characteristics of the population group tested; the frequency, in certain parts of the country, of pulmonary calcifications among nonreactors to tuberculin who react to histoplasmin; the use of the photofluorograph and the attempts to determine, by group work, the human error in the interpretation of chest films; BCG vaccination; the dangers for tuberculosis control arising from streptomycin treatment and the necessity in spite of the use of chemotherapeutic agents to provide more beds for isolation and treatment; the importance of laboratory examinations for tubercle bacilli; pneumothorax and surgical therapy; epidemiology; the unsolved problem of the hospitalization of the tuberculous, due to the insufficient number of beds available especially for minimal cases. In this latter respect it is suggested that the clinically not active cases should be supervised and minimal cases of uncertain or active status and the more advanced cases should be hospitalized; the remediable positive-sputum cases should be hospitalized first, the irremediable positive-sputum cases should be isolated in a single room in a general hospital during the terminal episode, or, if this is impracticable, the hopeless case must be cared for in the home under the best possible isolation technique. We must think of the community first and of the individual next when hospital beds are restricted. The private physician has a certain public as well as private responsibility, and, in this connection, his importance as a factor in promotion of public health and his duty of reporting to the health department all his tuberculous cases and his delinquent patients are stressed. His participation in the official field studies, the routine use of the tuberculin tests on every patient in rural districts, the examination of family contacts and the search for the original spreaders would assist in epidemilogical investigation. The cost of such a rapidly expanded program will be high as a short-time expenditure but low when compared with the cost of control over a

period of several decades and with the savings in sickness and death to be accomplished by such a plan. In order to conquer the disease, the standard of living must be greatly improved, especially among many of the non-white groups of the population.—*Community-wide Chest X-ray Surveys and the General Practitioner, H. E. Hilleboe, Journal-Lancet, June, 1947, 27: 225.—(O. Pinner)*

Tuberculosis Control.—Among the diseases now epidemic in war stricken areas, tuberculosis has again become a fearful problem. Disease is not hampered by barriers, thus it is in the self-interest of relatively healthy and well-fed nations to prevent the spread of tuberculosis in any area. The United States has not been directly touched by the war; indeed, through the war years tuberculosis has continued to decline. But this happy circumstance is not wholly the consequence of our fortunate situation. A historical survey, given briefly in this paper, shows the continuous efforts of private and public agencies to control and finally eradicate tuberculosis in this country. Since its establishment on July 1, 1944, the Tuberculosis Control Division of the United States Public Health Service has been guided in this fight by four major principles: (*1*) case-finding; (*2*) medical care and isolation; (*3*) after-care and rehabilitation; (*4*) protection of the tuberculous patient and his family against economic distress. Case-finding, recently using the miniature X-ray film, reaches large groups of the population—more than 25 million persons by the end of 1946—and thereby discovers minimal lesions; while in former years only 10 per cent of admissions to tuberculosis hospitals were minimal cases, now 70 per cent of all new cases found are minimal. Industrial workers as a group have been one of the chief interests of the Tuberculosis Control Division; a program is under way to provide for routine X-ray examination of a second large group, namely, all patients, out-patients and employees coming into general hospitals. Medical care and isolation of infectious cases must not be delayed by inadequate sanatorium care. However, in America we are faced with the problem of providing at least 50,000 additional sanatorium beds. As mass radiography detects larger numbers of patients with early disease, shorter periods of hospitalization than necessary under the present circumstances will frequently be the rule. Such persons need only enter convalescent homes for the transition period or may be regularly transferred to the chest clinic. After-care and rehabilitation, medical, social and financial guidance are often necessary for several years after discharge from the hospital. Sooner or later, it will be necessary to provide invalidism insurance for these people. Economic protection of the patient's family almost invariably resorts to public resources. Generous assistance has to be given needy families in order fully to utilize the benefits of other control activities; tuberculosis and poverty are often associated. "A national plan to provide adequate insurance for the family against loss of wages during the period of prolonged sickness is the only realistic answer to the problem." In the field of antibiotics preliminary results from the treatment with streptomycin give hope of suppressive action and point the way to further search for similar antibiotics. As consequence of other studies, it was determined that the United States Public Health Service should be responsible for long-range controlled studies of BCG vaccination. Researches have been undertaken regarding non-tuberculous calcifications, particularly those in histoplasmin reactors. The United States Public Health Service and the National Tuberculosis Association coöperate in the education of the public in the entire field of tuberculosis control.—*The Control of Tuberculosis in the Americas, T. Parran, Pub. Health Rep., June, 1947, 62: 827.—(O. Pinner)*

Chest X-ray Films of Hospital Admissions.—Because of the finding of many more tuberculous lesions in student nurses than would be expected, a program of taking a chest film on every patient admitted to the Meyer Memorial Hospital, Buffalo, New York, was initiated. Stereoscopic 4x5 inch miniature

films were taken. Over a period of two years the uncorrected figure for unsuspected tuberculosis was found to be 3.7 per cent and when this was corrected by the finding of positive sputum or postmortem examinations it was found to be 1.8 per cent. It is believed that at least 2.5 per cent of all new patients would be proved to have pulmonary tuberculosis by adequate investigation and that those cases with suspicious X-ray findings should be handled as such until proved otherwise.—*Routine Chest Roentgenograms of Hospital Admissions, G. N. Seatchard & D. O. Duszynsci, Dis. of Chest, July-August, 1947, 13: 312.*—(*E. A. Rouff*)

Tuberculosis in Belsen Camp.—Of 6,000 inmates found at Belsen, 90 per cent were free of cardiac and pulmonary lesions on X-ray examination. Advanced pulmonary tuberculosis was found in 9 per cent, while the number of minimal lesions was small. The findings are interpreted as indicating survival of the most resistant ones.—*Die Schirmbildbefunde von Belsen, F. Kollbrunner, Schweiz. Ztschr. f. Tuberk., 1947, 4: 118.*—(*B. Gerstl*)

Tuberculosis among Medical Students.—Primary tuberculous infection now occurs later than it did at the beginning of this century. This is brought out by the results of skin tests. While five decades ago the cutaneous reaction was positive in an immense majority of 18-year-old individuals, a considerable portion of this age group now shows negative skin tests and remains so beyond 20 and even close to 30 years of age. A follow-up of 1,047 medical students averaging 22 years was made for four to six years. At the start there were 117 (11.35 per cent) negative and 904 positive cases among 883 males and 164 females. The percentage of negative reaction among the females was considerably higher than in the males (15.8 per cent against 10.47 per cent). Nine of the 1,047 students had manifest clinical tuberculosis. Three knew about it, 6 did not. The 904 Pirquet-positive cases could be divided into two groups: 658 (72.8 per cent) with a normal chest film and 246 (27.2 per cent) presenting sequelae of a pulmonary or pleural infection. Cases with negative skin test but revealing lesions on radiography were not encountered. Calcification should be taken as evidence of tuberculosis, except in cases of echinococcus infection. Of the Pirquet-negative cases, primary infection occurred in 34 per cent during the time of observation while only 4.37 per cent of the Pirquet-positive cases showed evidence of reinfection. The reinfections, however, were more severe than the primary lesions. Early treatment resulted in recuperation of 90.9 per cent, allowing these students to continue their courses.—*La tuberculose des estudiants en médecine, E. Rist, Schweiz. Ztschr. f. Tuberk., 1947, 4: 94.*—(*E. Oesterlin*)

Rehabilitation.—Rehabilitation in tuberculosis has been defined as "the restoration of the patient to the fullest physical, mental, social, vocational, and economic usefulness of which he is capable." For reaching this goal case-finding is important. Extensive and prolonged therapy is necessary in advanced cases with their emotional and psychological concomitants which seriously reduce the capacity for work, while early diagnosis will be followed by complete recovery. The process of rehabilitation is important in case-finding; actively employed, cured tuberculous patients testify to the utility of early diagnosis. The type of treatment—collapse therapy or bed-rest—should be chosen with the economic and social circumstances of the patient in mind. Most patients must be almost ready to work when leaving the hospital. Education for a practical employment objective must be started as early as possible under consideration of the individual's limitations, skills, interests and abilities. A program in teaching elementary and advanced subjects is an essential for every institution in which tuberculosis is treated. Occupational therapy has to be related to the patient's actual needs and his preparation for a successful vocational adjustment; the library helps by teaching the use of reading material.

Adjustment to the reality of having tuberculosis and confidence must be brought about by physicians, nurses and other people coming in contact with the patient. Tuberculous patients have greater difficulty than others in finding a happy integration in the life of the community; the author tries to develop interest in the common problems of the hospital community, responsibility and group discipline, by creating a patient council, a patient-operated paper and other social activities. The problems arising from the insecurity prevalent after discharge from the hospital should be anticipated during hospitalization. An understanding physician, with the aid of a public health nurse and a social worker, will help the patient to overcome these difficulties. The Office of Vocational Rehabilitation under the Federal Security Agency has, in coöperation with the States, the responsibility of developing a program of vocational rehabilitation for physically disabled persons, including tuberculous patients. It has funds available for training and education which will lead to a reasonable chance of a patient's becoming employable and for support of the patient during the period of rehabilitation. The costs of rehabilitation are overcompensated for by savings of expenses which, without this procedure, would arise from readmissions, maintenance for the family of a rehospitalized breadwinner, the hospitalization of patients infected by relapsing persons and the consequences of broken families in terms of juvenile delinquency and public dependency.—*The Need for Total Rehabilitation of the Tuberculous, H. M. Payne, Nat. M. A., May, 1947, 39: 111.*—(*O. Pinner*)

Tuberculosis without X-ray Evidence.—The work for this thesis was started in the Sanatorium Putaendo in 1943 on a series of 46 patients who were clinically inactive but had a positive sputum. Standardized and serialized X-rays films showed, if anything, completely unchanging residual lesions. The majority of these patients had lesions of the hematogenous type. More than half had bilateral lesions. Pneumothorax and phrenemphraxis done in 20 cases did not convert the sputum. In the X-ray films, no changes were observed during a period of three to forty-one months (average thirteen months). The sputa were positive, either on direct examination, culture or gastric lavage. This, of course, is a definite sign of an open lesion in the respiratory tract. Only tomography may detect the presence of small cavities or infiltrations. In case of negative X-ray findings, bronchoscopy and bronchography should be done and, if necessary, repeated. In 10 of the cases, specific lesions in the trachea or main bronchi were found only during bronchoscopy. Four of those also had bronchiectases; 25 cases presented small localized bronchial dilatations which are believed to be the source of the positive sputum. In 5 cases, no lesions responsible for the positive sputum could be found. This is attributed to the insufficiency of present diagnostic methods. As neither rest nor collapse therapy result in a cure, it is suggested to discharge those patients with occasional positive findings but to keep them and their contacts under periodic supervision.—*El problema de tuberculoso pulmonar bacilifero con imagen radiologica de aspecto residual, Doctor Dissertation, J. Sabbagh Dada, Published by "Relampago", Santago de Chile, 1945, Pp. 63 with 124 illustrations.*—(*W. Swienty*)

Regression of Hematogenous Pulmonary Lesions.—A 23-year-old male, who showed no primary lesions in an earlier chest film, later developed multiple nodular shadows of irregular outline in both lungs. These sometimes were confluent and were interpreted as secondary exudative lesions due to extensive hematogenous dissemination. Over a period of fifteen months the lesions gradually regressed. One year later, the urine was positive for tubercle bacilli and a diagnosis of tuberculous prostatitis was made. Shortly after, a dorso-lumbar spondylitis with cold abscess in the lumbar region was noted. The following year, the patient died of a tuberculous meningitis.—*A propos de la régression*

de l'image radiologique des lésions micronodulaires des poumons, R. Jeanneret & P. Siegrist, Schweiz. Ztschr. f. Tuberk., 1947, 4: 247.—(E. Oesterlin)

Constitution and Tuberculosis.—Constitution has a definite influence on the acquisition and the course of tuberculosis. Of all tuberculous patients in Chile, 47 per cent were mestizoes with a predominantly white component, 25 per cent were real mestizoes, 19 per cent almost pure whites and less than 7 per cent pure whites. Negroes and mulattos gave a very small percentage according to the small number living in Chile. Among the pure whites, the relation between latent and active cases is 1:7, whereas among the mestizoes, it is 1:14. The tendency to localization of the tuberculous process is twice as good in the whites as in the mestizoes. The clinical history of the whites is generally a long one, whereas in mestizoes the disease is very often a fulminating one, although the lesions may be of the same type in both races. Bilateralization is predominant in whites and rare in mestizoes but extrapulmonary localizations are three times as predominant in mestizoes as in whites. Sex is no factor in the severity of the infection. The asthenic type contributes 82.3 per cent of all cases. In this body type, 36.4 per cent show far advanced lesions, whereas of all the rest, only 26 per cent are of the far advanced type. Productive lesions are found in 40 per cent of the asthenics as against 52.1 per cent of the nonasthenic type. All patients of the plethoric type show progressive bilateral lesions. There were 62.3 per cent of the patients who were underweight. The disease was generally more advanced and more progressive in underweight patients than in those with normal weight or those that were overweight. Fifty-three per cent of the patients were up to 28 years of age, 42.3 per cent from 28 to 56 and 4.6 per cent were over 56 years old. In older patients, the course of the disease is more benign.—*Constitucion y tuberculosis, R. Toro Rojas, Ap. respir. y tuberc., Santiago, January-March, 1947, 12: 63.—(W. Swienty)*

Pyopneumothorax in Primary Tuberculosis.—This condition is extremely rare. The case described is the second ever to be published in Cuba. A 19-months-old infant was exposed to repeated massive contact and acquired a primary infection. Gastric lavage was positive for acid-fast bacilli. The lesions underwent rapid caseation and ulceration and finally the pleura was perforated. The exudate became a mixed empyema by descending infection. Despite thoracotomy and pleural lavage with tyrothrycin, the patient died. The value of surgical treatment is discussed. There is to-day a greater readiness for immediate sugery as a life-saving intervention, especially if it is done under completely aseptic conditions and bactericidal and bacteriostatic products like penicillin and tyrothricin are being used freely.—*Primoinfeccion tuberculosa a evolucion maligna complicado con pioneumotorax, R. Valledor, Rev. cubana de tuberc., July-September, 1946, 10: 250.—(W. Swienty)*

Primary and Reinfection Tuberculosis.—The terms primary and reinfection tuberculosis are inaccurate and should not be used to designate specific anatomical and clinical types. No morphological data support the alleged differences between such lesions. Such differences as have been described may be explained by the time elapsed between the primary attack and reinfection. Reinfection does not necessarily mean a type characterized by little or no node involvement. It may also prove to be the determining cause bringing about a progressive primary type lesion. This has been the case with Negro workers in South African mines, American Negroes and probably to a large extent among Brazilian Negroes and mulattos. The type of lesions in reinfection cases depends on a number of variables, including virulence, dosage of infection, allergic hypersensitiveness and acquired and natural resistance. The rôle of the genetic factor has also of late received recognition. However, all these variables are closely interdependent. When stating that the genetic constitution of the Negro predisposes him to tuberculosis, it is also meant

that tuberculous infection incites in him a higher allergic sensitiveness and a lower immunity than among less susceptible persons. Illustrations of 3 typical cases in 17 to 18-year-old girls are attached to demonstrate the lack of a morphological distinction between primary and reinfection lesions.—*Tuberculose de primo-infecção e de re-infecção, F. Poppe de Figuerredo, Rev. brasil. de tuberc., November-December, 1946, 15: 465.*—(*A. A. Moll*)

Artificial Pneumoperitoneum.—During a pneumoperitoneum refill, an omental vein was punctured, resulting in a fatal hemorrhage. A similar accident occurred in a second case but did not result in a fatality. This complication occurred twice in 3,616 refills in 129 patients.—*A Case of Fatal Peritoneal Hemorrhage Complicating Artificial Pneumoperitoneum, V. C. Cornwall & W. H. Partridge, Tubercle, August, 1947, 28: 164.*—(*A. G. Cohen*)

Intrapleural Pneumonolysis.—In 820 operations for section of pleural adhesions, there were 40 cases in which appreciable postoperative bleeding occurred. No cases of hemorrhagic diathesis were involved. There were other cases with slight bleeding (less than 2 ounces). In 20 cases, it was necessary to perform thoracoscopy within a week after onset in order to break up and aspirate blood clots; in 2 other cases thoracoscopy was required in order to stop bleeding. Blood transfusion was needed in 14 cases. Hemothorax was originally regarded as something of a disaster. If not fatal, it led to obliteration of the pneumothorax or to empyema. The artificial pneumothorax suffered no harm in only 6 of the 40 cases. In 18, there was slow creeping out of the lung at the base. In 6 cases, the hemothorax did not start until at least two days postoperatively; in the other 3 cases, it occurred within two days. The source of the blood was in the cannula tract in 9 cases, in the adhesion stump in 4 cases and unknown in 26. Hemothorax is less frequent if pneumonolysis is complete. Empyema occurred in 14 cases. Obliteration of the pneumothorax space occurred in 10 cases; in many, the cavities remained closed and the sputum negative. From follow-up studies, it was found that the original pessimism was not justified. Nevertheless it is an unwelcome complication. In prevention, careful postoperative handling of the patient is regarded as important. Should bleeding occur, early withdrawal of blood is desirable.—*Haemothorax following Section of Pleural Adhesions, W. E. D. Moore & J. Watt, Tubercle, August, 1947, 28: 161.*—(*A. G. Cohen*)

Pneumonolysis.—Indications and technique of Maurer's modification of pneumonolysis are presented in detail. This method combines diathermic coagulation with electrocautery and reduces complications to a minimum. The majority of European authors recommends now to sever adhesions early. Adhesions even if not preventing collapse of the lung should be included because tuberculous foci within and beneath adhesions never heal. Thoracoscopy is the only way to judge extent and operability of adhesions. Thoracoplasty is to be preferred in cases where caustic procedures involve more than usual risk.—*Gegenwärtiger Stand der Thorakokaustik nach der Methode von Maurer, H. R. Stettbacher, Schweiz. Ztschr. f. Tuberk., 1947, 4: 63.*—(*B. Gerstl*)

Pneumonolysis.—A total of 820 operations for section of adhesions was performed on 557 different patients. Upon discharge, the disease was quiescent in 211 cases, much improved in 117 and improved in 121. Complete pneumonolysis was obtained in 235 cases, nearly complete in 90, partial in 239 and slight in 23. The effect was considered good in 276 cases and moderately good in 170. Temperature rises of over 101°F. occurred in 74 cases, not over 101°F. in 113, not over 100°F. in 223 and not over 99°F. in 180. Early pleural effusions were found in 293 cases; only cases in which the fluid reached the dome of the diaphragm were counted. In 125 cases, the fluid disappeared in less than

three weeks. Late effusions were found in 83 cases. In 23, they occurred during the third to eighth week; in 60, they occurred after the eighth week. How many were attributable directly to the operation is uncertain. Many were severe, with a high percentage containing tubercle bacilli and resulting in empyema. Of the 83 cases, 17 lasted less than twelve weeks and 56 lasted longer. In 17 cases, the artificial pneumothorax had to be abandoned and in 13 the pleural space was obliterating. Fourteen of the patients have done well and 39 moderately well. Very few empyemata occurred in thoracoscopy cases in which no adhesions were cut, indicating that these late effusions were attributable to section. Hemothorax occurred in 5 per cent and empyema in 10 per cent of all cases. Eight per cent of the early effusions, 24 per cent of the late effusions and 35 per cent of the hemothoraces became purulent. In a few cases, repeated aspiration resulted in drying up of the fluid, so that pneumothorax could be continued. Lavage with Azochloramide-T was valuable. When the effusion became purulent, pneumothorax was discontinued and attempts were made to reëxpand the lung. If there was extensive previous disease, reëxpansion was not attempted; instead, a thoracoplasty was preferred. The cytology of the fluid was no guide to the outcome. Other complications were spontaneous pneumothorax in 15 cases, bronchopleural fistula in 4 cases and air embolism in 2 cases (fatal in one).—*The Complications of Adhesion Section in Pulmonary Tuberculosis, J. Watt, Tubercle, August, 1947, 28: 158.*—(*A. G. Cohen*)

Endobronchial Tuberculosis and Collapse Therapy.—Pneumothorax or phrenicectomy in cases complicated by endobronchial tuberculosis may cause irreversible atelectasis. A partial plastic may be successful in cases of collapse involving only the upper lobe. An extensive thoracoplasty should be carried out only if bronchostenosis, resulting from healed endobronchial lesions, prevents reëxpansion of the lung. In view of the otherwise poor prognosis, pneumonectomy may be indicated if the bronchial stenosis causes retention of secretion and bronchiectasis.—*Die Bronchustuberkulose vom Standpunkt des Chirurgen, A. Brunner, Schweiz. Ztschr. f. Tuberk., 1947, 4: 218.*—(*B. Gerstl*)

Resection in Tuberculosis.—The indications for total pneumonectomy in tuberculosis are: the active cavernous type with stenosis of the principal bronchus; hemoptysis due to bronchial dilatation or disseminated pneumonitis; multiple residual cavities after thoracoplasty; tension cavity with extensive homolateral lesions (in preference to cavity drainage); other unilateral conditions in which pneumothorax is not adequate. Lobectomy is indicated for: cavities of a lower lobe which are not influenced by pneumothorax or phrenicectomy; cavities in other lobes which do not respond to collapse therapy, especially in children and adolescents where, by this treatment, a crippling scoliosis can be avoided; open cavity after thoracoplasty; tuberculoma; bronchiectases limited to one lobe. Even very active lesions or lesions in other parts of the lung, as long as they show tendency to regression, are not contraindications. The greatest disadvantage is that, during pulmonary resection, healthy lung tissue must be sacrificed and thus a definite tendency to a lowering of the respiratory function in the not resected segments is created. Complications are: bilateralization in 11 per cent of all operated cases; exacerbation of inactive foci; empyema and ulcerations in the bronchial stump. Adequate pre- and postoperative care tends to diminish these complications. In the opinion of the authors, primary pulmonary resection has its definite place in the surgical treatment of tuberculosis. Three case histories are given.—*Las resecciones pulmonares en tuberculosis en el Hospital Sanatorio "La Esperanza", E. Iglesias, S. Caroll del Valle, M. Garcia, A. Sanchez de Fuentes, Jr. & D. Madam, Rev. cubana de tuberc., April-June, 1946, 10: 162.*—(*W. Swienty*)